

REMARKS

Claims 1-19 remain pending in this patent application.

In this paper, claim 1 has been amended.

INTERVIEW WITH EXAMINER

Applicant is most appreciative of the courtesies and consideration extended to its representative, Frederick R. Handren (Reg. No. 32, 874) during a telephone interview that took place on February 19, 2009.

Applicant's representative argued for the withdrawal of the three rejections lodged by the Examiner in the outstanding Office Action, on the basis that the combination of disclosures in US 6750911 B1 (Kobayashi et al.) US 4514755 (Tabei) employed in all of the rejections would not have been obvious and could not meet the requirements of Applicant's claims. In particular, Applicant's representative argued that the imager disclosed in Tabei did not have attributes, that could be equated with the electric charge storage layers recited in Applicant's claims. The Examiner disagreed, maintaining that a charge-storing property is inherent in the layers 103, 104, shown in Figs. 6 and 11 of Tabei and that the proposed combination of the teachings in Kobayashi et al. and Tabei would have been obvious and would meet the requirements of the claims as presented at the time of the October 22, 2008, Office Action.

Applicant's representative also asked the Examiner to consider proposed amendments to claim 1 that more clearly distinguish the claimed subject matter from disclosures in the applied prior art. The amendments to claim 1 presented in the interview are the same as the amendments to claim 1 made in this paper. The Examiner said that the amendments to claim 1 would obviate the rejections of the claims stated in the outstanding Office Action, without saying that the amendments would render the claims allowable.

ALLOWABLE SUBJECT MATTER

Applicant notes with appreciation the Examiner's recognition of allowable subject matter in claims 7, 8, 15 and 18. For reasons presented below, Applicant submits that all of the pending claims are in condition for allowance.

PRIOR ART REJECTION I

Claims 1, 4 and 12 were rejected under 35 USC § 103(a) as being unpatentable over US 6750911 B1 (Kobayashi et al.) in view of US 4514755 (Tabei). Applicant traverses this rejection insofar as it might be deemed applicable to claims 1, 4 and 12 as now presented.

The Examiner relies on Kobayashi et al. for a disclosure of "a CCD color solid-state image pickup device and particularly cites FIG. 2, column 3, lines 59-67, and column 4, lines 22-40, of Kobayashi et al. As shown in FIG. 2 and described in the cited passages of Kobayashi et al., a CCD imager 20 employs a plurality of light receiving elements 20a, a plurality of vertical transfer registers 20b for vertically transferring charges from the light receiving elements 20a and a horizontal transfer register for transferring charges transferred through the vertical transfer registers 20b. The Examiner concedes that Kobayashi et al. does not disclose "wherein the electric charge storage section of each of the light-receiving sections has a plurality of electric charge storage layers which are provided in a depthwise direction of the semiconductor substrate with potential barriers interposed therebetween," as required by Applicant's claims.

As described in column 3, line 66, through column 4, line 7 of Kobayashi et al., each of the light-receiving elements 20a is overlaid by one of an R, G or B color element of a primary color filter 20d, whereby, in each of the light-receiving elements 20a, light of just one of the primary colors undergoes photoelectric conversion. The CCD color solid-state image pickup device disclosed and claimed in this application is explicitly intended to be an improvement over an imager such as the one disclosed in Kobayashi et al., as discussed in the specification of this application on page 1, lines 15-25.

The Examiner characterizes Tabei as disclosing "a solid state imager ... wherein the electric charge storage section of each of the light-receiving sections has a plurality of electric charge storage layers which are provided in a depthwise direction of the semiconductor substrate with potential barriers interposed therebetween" and contends that it would have been obvious "to modify the device in Kobayashi et al. by the teaching of Tabei in order to provide a solid-state color imager which can be produced color signals without the need of multicolor filters."

On pages 7-8 of the May 27, 2008, Reply filed in this application, Applicant observed:

The Tabei imager does not have electric charge storage layers, and does not have vertical transfer paths, as recited in claim 1. A device similar to the Tabei imager is discussed under the heading, "Description of the Related Art," in the specification of this application on page 5, lines 4-9. The Tabei imager incorporates a base with superimposed photosensitive layers that can detect and absorb light of different colors. As described in column 6, line 63, through column 7, line 16, and shown in Fig. 3 of Tabei, each of the photosensitive layers 3, 4, includes a sublayer of photoconductive material sandwiched between a top transparent electrode sublayer and a bottom transparent mosaic electrode sublayer. As described in column 7, lines 62-68, the sublayers 36, 33 of photoconductive material undergo a decrease in resistance in response to incident light, and the reduced resistance is detected and recorded by the top and bottom electrode sublayers. The Tabei imager cannot be fairly characterized as a "CCD color solid-state image pickup device" with "electric charge storage sections" having "a plurality of electric charge storage layers," as required by claim 1.

Applicant submits that the Examiner's characterization of the Tabei disclosure is incorrect, since the device disclosed in Tabei cannot be fairly regarded as incorporating "electric charge storage sections" having "a plurality of electric charge storage layers."

It is not clear from the Examiner's statement of the rejection just how the the Kobayashi et al. device would be modified "by the teaching of Tabei," as proposed by the Examiner. Kobayashi et al. discloses a CCD imager, whereas Tabei discloses a device that is *not* a CCD imager. Apparently, the Examiner is proposing a gross reconstruction of the Kobayashi et al. imager, whereby it would employ an imager like the one disclosed in Tabei. The resulting imager would not be recognizable as a device made according to the teachings in Kobayashi et al. Furthermore, the resulting imager could not be fairly characterized as a CCD color solid-state image pickup device and would not have "electric charge storage sections" having "a plurality of electric charge storage layers," as required by Applicant's claim 1.

In this paper, Applicant has amended claim 1 to recite the electric charge storage section of each of the light-receiving sections as having a plurality of electric charge storage layers which are *formed in a silicon layer and wherein each of the plurality of electric charge storage layers is different in the depthwise direction from the others of the plurality of electric charge storage layers*. Support for these amendments to claim 1 can be found, for example, in drawing Figs. 6A, 6B and 6C and in the description of those drawing figures on pages 18-20 of the specification. As noted above, the Examiner said that the amendments to claim 1 would overcome the rejection.

In view of the foregoing observations, Applicant submits that no reasonable combination of the teachings in Kobayashi et al. and Tabei et al. can properly serve as a basis for rejecting claims 1, 4 and 12, as now presented, under 35 USC § 103(a).

PRIOR ART REJECTION II

Claims 2 and 3 were rejected under 35 USC § 103(a) as being unpatentable over Kobayashi et al. in view of Tabei and further in view of US 7132724 B1 (Merrill). Applicant traverses this rejection insofar as it might be deemed applicable to claims 2 and 3 as now presented.

The Examiner characterizes Merrill as disclosing attributes of the electric charge path and the charge storage layers recited in claims 2 and 3 and contends that it would have been obvious to modify the Kobayashi et al.-Tabei et al. device to incorporate these attributes.

Without acquiescing in the Examiner's proposal to modify the proposed Kobayashi et al.-Tabei et al. device, Applicant notes that there is no disclosure in Merrill that can remedy deficiencies in the proposed Kobayashi et al.-Tabei et al. device vis-à-vis the requirements of amended parent claim 1. As noted above, the Examiner conceded at the interview that amended claim 1 obviates this rejection.

In view of the foregoing observations, Applicant submits that no reasonable combination of the teachings in Kobayashi et al., Tabei et al. and Merrill can properly serve as a basis for rejecting claims 2 and 3, as now presented, under 35 USC § 103(a).

PRIOR ART REJECTION III

Claim 9 was rejected under 35 USC § 103(a) as being unpatentable over Kobayashi et al. in view of Tabei and further in view of US 6535249 B1 (Stavely). Applicant traverses this rejection insofar as it might be deemed applicable to claim 9 as now presented.

The Examiner characterizes Stavely as disclosing a digital camera optical system that employs a microlens for gathering image light and contends that it would have been obvious in view of the Stavely teachings to modify the Kobayashi et al.-Tabei et al. device to incorporate such a light gathering element.

Without acquiescing in the Examiner's proposal to modify the proposed Kobayashi et al.-Tabei et al. device, Applicant notes that there is no disclosure in Stavely that can remedy deficiencies in the proposed Kobayashi et al.-Tabei et al. device vis-à-vis the requirements of amended parent claim 1. Again, as noted above, the Examiner conceded at the interview that amended claim 1 obviates this rejection.

In view of the foregoing observations, Applicant submits that no reasonable combination of the teachings in Kobayashi et al., Tabei et al. and Stavely can properly serve as a basis for rejecting claim 9, as now presented, under 35 USC § 103(a).

ALLOWABILITY OF WITHDRAWN CLAIMS

In the discussion above, Applicant has shown that claim 1 is allowable. Since claim 1 is generic to all of the species identified by the Examiner, and since all of the withdrawn claims depend directly or indirectly from claim 1, Applicant requests that the Examiner consider the withdrawn claims on their merits and recognize these claims as allowable.

CONCLUSION

In view of the amendments, observations and arguments presented herein, Applicant respectfully requests that the Examiner reconsider and withdraw the rejections stated in the outstanding Office Action and recognize all of the pending claims as allowable.

If unresolved matters remain in this application, the Examiner is invited to contact Frederick R. Handren, Reg. No. 32,874, at the telephone number provided below, so that these matters can be addressed and resolved expeditiously.

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Reply to Office Action of October 22, 2008

Docket No.: 0649-0948P

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.17, particularly, extension of time fees.

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Respectfully submitted,

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